Investigation of the Sudden Commencement of the Magnetic Storm by Induction Magnetograph.

INVESTIGATION OF THE SUDDEN COMMENCEMENT OF THE MAGNETIC STORM BY INDUCTION MAGNETOGRAPH

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(Received October 31, 1949)

It is well known that the magnetic storm occurs simultaneously over the whole area of the earth and the sudden commencement occurs nearly at the same time and the amplitude of the main phase and the sudden commencement is greater in the night hemisphere than in the day hemisphere. The authors observed $\frac{dH}{dt}$ of the magnetic storm

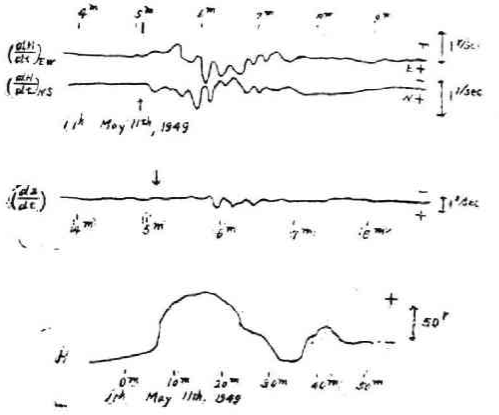

Fig. 1. A 1. Sudden Commencement Occurred in the Hemisphere at Daytime.

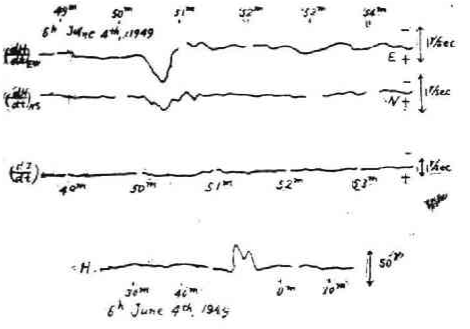

Fig. 1. A 2. Sudden Commencement Occurred in the Hemisphere at Daytime.

by the induction magnetometer at Onagawa ($\lambda = 141°28'$ E, $\varphi = 38°26'$ N) near Sendai and found the following results.

1) The type of the change $\frac{dH}{dt}$ at the sudden commencement varies respectively, according as it occurs in the night hemisphere or day hemisphere; that is, the oscillation of $\frac{dH}{dt}$ is very remarkable at daytime, while it is very weak at night. In the day hemisphere the amplitude of the oscillation of $\frac{dH}{dt}$ is greater than that which occurs in the night hemisphere. Fig. 1 shows only some examples; the above stated characteristic is very remarkable and occurs almost without exception. This fact is reverse of the statistical result obtained from the records of the usual variometer of H or D.

2) A remarkable micro-pulsation of $\frac{dH}{dt}$ at the sudden commencement frequently took places during the summer and equinox, while it is weak during the winter.

From these results we consider that the sudden commencement is attributable to the electric current system in the ionosphere due

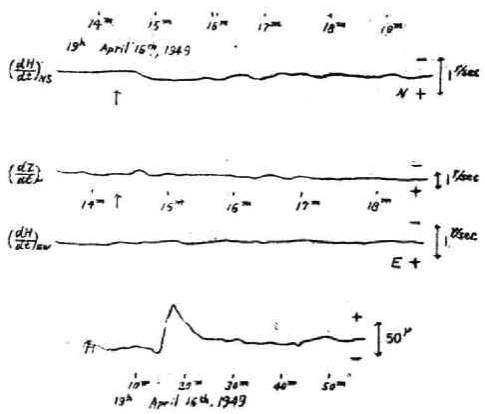

Fig. 1. B 1. Sudden Commencement Occurred in the Hemisphere at Night.

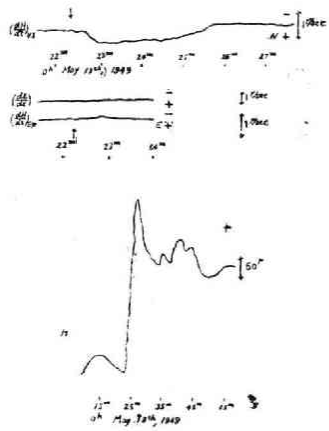

Fig. 1 B 2. Sudden Commencement Occurred in the Hemisphere at Night.

to the ionization by the sudden increase of the solar radiation.

Further study concerning the mechanism of the sudden commencement will be discussed in near future.

The authors wish to thank Ministry of Education whose financial support made these researches possible.